

Strengthening the Rural Economy through Coffee Agroindustry and Appropriate Technology in Lahat Regency, South Sumatra

Deby Chintia Hestirinia^{1*}, Lishapsari Prihatini², Nopriawan Mahriadi³,
Ahmad Roziqin⁴, Weria Handayani⁵, Fernando Agung Pribadi⁶

^{1,2,3,4}Stisipol Candradimuka, Indonesia

^{5,6}Magister Ilmu Administrasi Publik Stisipol Candradimuka, Indonesia

Corresponding Author: Deby Chintia: deby.chintia.hestirinia@stisipolcandradimuka.ac.id

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Mahriadi, Roziqin, Handayani, Pribadi

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ABSTRACT

This community service program aims to strengthen the rural economy through the development of an appropriate technology-based coffee agroindustry in Keban Agung Village, Lahat Regency, South Sumatra. The main problems faced by the community include low coffee productivity, traditional post-harvest management, and limited product marketing. The implementation method is carried out through a participatory approach in the form of socialization, intercropping system training, assistance in the use of post-harvest coffee technology, and branding and digital marketing training. The activity was carried out for four months by involving farmer groups, the village government, and the Lahat Regency Agriculture Office. The results of the activity show that there is an increase in farmers' understanding of sustainable agriculture, an improvement in the quality of coffee products, and the growth of community business capacity through the strengthening of local agro-industry. This program has a positive impact on strengthening the economy of the village community in an inclusive and sustainable manner.

INTRODUCTION

Rural development is one of the strategic agendas in realizing the equitable distribution of people's welfare in Indonesia. Rural areas have an important role as a production base for the agricultural sector as well as a support for national economic resilience. However, most villages in Indonesia still face various structural problems such as low agricultural productivity, limited infrastructure, low quality of human resources, and weak market access.

The agricultural sector is still the main source of livelihood for rural people, especially in disadvantaged areas. Agriculture not only functions as a food provider, but also as a source of income and employment for rural communities. Therefore, strengthening the agricultural sector based on local potential is an important step in supporting the sustainable economic development of the community (Taufiq, 2016).

Lahat Regency, South Sumatra, is one of the areas that has great potential in the robusta coffee plantation sector. The geographical conditions of the highland area with a good level of soil fertility make Lahat Regency suitable for the development of coffee commodities. Robusta coffee has become the community's leading commodity and has an important contribution to the local economy (Prakoso et al., 2024). Despite having high natural resource potential, Lahat Regency is still categorized as a disadvantaged area in several development indicators. The low economic competitiveness of the community and limited access to business development are the main challenges in strengthening the rural economy in the region (Abidin, 2023).

One of the robusta coffee producing areas in Lahat Regency is Keban Agung Village, Mulak Sebingkai District. Most of the village communities depend on the coffee farming sector which is managed for generations. Coffee is not only an economic commodity, but also part of the social and cultural identity of the local community. However, the management of coffee farming in Keban Agung Village is still carried out traditionally and has not applied the principles of sustainable agriculture optimally. Most farmers still use monoculture patterns and rely on excessive use of chemical fertilizers. These conditions have an impact on reducing soil quality and agricultural productivity (Evizal & Prasmatiw, 2024).

In addition to cultivation problems, coffee farmers in Keban Agung Village also face problems in processing crops. Post-harvest management is still carried out simply without adequate technological support. As a result, the quality of the coffee produced is less stable and has a low selling value in the market (Marniza et al., 2024).

Most farmers sell their crops in the form of coffee logs to middlemen at relatively low prices. This condition causes farmers to not get optimal economic added value from the coffee commodities produced. In fact, the development of the coffee agroindustry has the potential to increase people's income through a more modern product processing process with high economic value.

The coffee agroindustry is a form of downstream agricultural products that are able to increase the added value and competitiveness of local products. The development of community-based agro-industry can create new business

opportunities and strengthen rural economies in a sustainable manner (Fitiryanti et al., 2025).

In the context of rural development, strengthening agro-industry based on local potential is a strategic approach to reduce people's dependence on the sale of raw materials. Through the development of agroindustry, communities can gain greater economic benefits through better product processing, packaging, and marketing. Strengthening the rural economy cannot be separated from the process of community empowerment. Community empowerment is an effort to increase community capacity to be able to manage local potential independently and sustainably. A participatory approach is important so that the community is actively involved in every stage of village development.

Community empowerment in the agricultural sector needs to be carried out through increasing the capacity of farmers' knowledge and skills. Training on sustainable agriculture, post-harvest technology, and digital marketing is an important part of improving the quality of village communities' businesses. One of the relevant sustainable farming approaches applied to coffee plantations is the intercropping system. The intercropping system is a cultivation pattern by planting more than one type of plant in one agricultural land. This approach is able to maintain soil fertility, reduce the risk of erosion, and improve land use efficiency (Evizal & Prasmatiwi, 2024).

The implementation of the intercropping system also provides economic benefits for farmers because it can generate additional sources of income from companion crops. In addition, this system helps maintain the balance of the agricultural ecosystem so that it is more adaptive to climate change. Climate change is one of the main challenges in the development of the agricultural sector in Indonesia. Weather fluctuations and changes in rainfall patterns have an impact on the productivity of coffee plants. Therefore, agricultural innovations are needed that are able to increase the resilience of the agricultural sector to environmental changes (Oktaviani et al., 2024).

In addition to aquaculture innovation, strengthening the rural economy also requires appropriate technological support. Appropriate technology is technology that is tailored to the needs and conditions of the local community so that it is easy to apply and sustainable.

In coffee processing, the use of post-harvest technology such as huller machines and pulper machines can help improve the quality of production results. This technology is able to speed up the coffee processing process and produce better quality coffee beans (Mawardi et al., 2019).

Improving the quality of coffee products is very important to strengthen the competitiveness of local products in regional and national markets. Good quality coffee products have higher economic value and open up wider market access opportunities for rural communities. In addition to product quality, the marketing aspect is also an important factor in community business development. The development of digital technology provides new opportunities for village communities to market their products more widely through social media and marketplaces. However, most rural communities still have limitations in the use of digital technology. Low digital literacy makes it

difficult for local products to compete with other products that already have modern marketing systems.

Digital marketing training is one of the solutions in increasing the capacity of village communities. Through digital marketing, people can introduce local coffee products to a wider range of consumers without relying on conventional marketing. Strengthening product branding is also an important part of the development of the coffee agroindustry. Products that have a good identity and packaging will be easier to recognize and have a higher market appeal.

In addition to economic aspects, the development of the coffee agroindustry also has an important social dimension. Agro-industrial activities can open up opportunities for the involvement of women and youth in productive economic activities in the village. The involvement of women in the processing and marketing of coffee products can increase household income while strengthening the role of women in village economic development (Rahmita et al., 2016). Meanwhile, the involvement of village youth in digital marketing and business innovation is important in creating the regeneration of agricultural business actors in rural areas. Youth have better technological adaptability so that they have the potential to become agents of change in village development.

Strengthening the rural economy based on the coffee agroindustry is also in line with the Sustainable Development Goals (SDGs) agenda. This program supports the goals of poverty alleviation, economic growth, sustainable consumption and production, and climate change management.

In the context of national policy, village development based on local potential also supports the development agenda of disadvantaged areas through strengthening the community's economy. The community-based development approach is considered more effective because it is able to adapt the program to the needs of the local community.

Community service activities are a form of implementation of the tridharma of higher education in supporting the development of rural communities. Universities have an important role in the transfer of knowledge, technology, and innovation to society. Through service activities, lecturers and students can collaborate with the community in solving various social and economic problems faced by the village. This approach is expected to be able to create sustainable social change.

Based on these conditions, a program to strengthen the rural economy is needed through the development of coffee agro-industry and appropriate technology in Keban Agung Village, Lahat Regency. This program is expected to be able to increase community capacity in sustainable coffee management and strengthen village economic independence.

This service activity focuses on the implementation of sustainable farming systems, strengthening post-harvest technology, and developing digital marketing of local coffee products. This approach is expected to increase the added value of coffee products and expand market access for rural communities. Thus, this community service activity is not only oriented to increasing agricultural production, but also to strengthening community capacity and developing an inclusive and sustainable village economy.

IMPLEMENTATION AND METHODS

Location and Time of Implementation

The community service activity was carried out in Keban Agung Village, Mulak Sebingkai District, Lahat Regency, South Sumatra. The implementation of the activity was carried out for four months, starting from January to April 2026. Participants in the activity consisted of:

1. Serasan Farmers Group
2. Farmer Group Advances Together
3. Keban Agung Village Government Apparatus
4. Representatives of the village women's and youth communities

The number of participants involved was 55 people.

Implementation Method

The method of implementing service is carried out with a participatory approach through the following stages:

1. Program Socialization

The initial stage was socialization about the importance of developing the coffee agroindustry and sustainable agriculture to the community and farmer groups.

2. Intercropping System Training

Training was provided on the application of an intercropping system to maintain soil fertility, reduce the risk of erosion, and increase the productivity of coffee fields.

3. Post-Harvest Technology Assistance

The community is given assistance in the use of appropriate technology in the form of huller machines and post-harvest coffee processing techniques to improve the quality of coffee beans.

4. Branding and Digital Marketing Training

This activity aims to improve the community's ability to package products, branding local coffee, and digital media-based marketing.

5. Monitoring and Evaluation

Monitoring is carried out periodically to see the development of understanding and implementation of the program by the community.

RESULTS AND DISCUSSION

Increased understanding of sustainable agriculture

The community service activities carried out in Keban Agung Village, Lahat Regency began with the identification of the agricultural conditions of the local community. The results of the observation show that most coffee farmers still apply traditional cultivation patterns that are inherited from generation to generation without any sustainable agricultural innovation. The agricultural system that is implemented is still oriented towards increasing short-term yields without paying attention to environmental conservation aspects. Before the program was implemented, the majority of farmers used a monoculture pattern on coffee plantation land. This pattern causes a decline in soil quality due to

continuous exploitation of nutrients. In addition, the excessive use of chemical fertilizers has become a common habit of the community in increasing coffee production. This condition has an impact on decreasing agricultural land productivity from year to year. Some farmers complain about higher production costs due to dependence on chemical fertilizers and pesticides. However, some people do not understand that the excessive use of chemicals can damage soil structure and reduce environmental quality.

Through initial socialization activities, the service team provided an understanding of the importance of sustainable agriculture as a solution in maintaining land productivity while preserving the environment. The materials provided include the concept of environmentally friendly agriculture, soil conservation, and sustainable management of natural resources. The community showed a fairly high enthusiasm for the material provided. This can be seen from the active participation in the discussion and question and answer sessions. Most farmers admit that they only understand the long-term impact of using chemical fertilizers on the condition of their farmland.

In the next stage, the service team introduced the intercropping system as one of the sustainable farming methods that can be applied to the community's coffee land. The intercropping system was chosen because it is in accordance with the geographical conditions of Keban Agung Village which is located in a hilly area with a fairly high level of erosion vulnerability. Intercropping system training is carried out through a hands-on approach on community-owned farmland. Farmers were given examples of how to plant intercrops between coffee plants to maintain soil fertility and improve land use efficiency.

Intercropping plants introduced in this activity include horticultural crops and ground cover crops that can help maintain soil moisture. In addition to improving the quality of the environment, intercropping can also provide additional income for the community.

Before the service program, most farmers did not know the economic benefits of the implementation of the intercropping system. They assume that other crops will interfere with coffee growth. However, after the assistance was carried out, the community began to understand that the intercropping system can actually increase overall land productivity. The implementation of an intercropping system also helps reduce the risk of soil damage due to high rainfall. The geographical condition of Keban Agung Village, which is located in the highlands, makes plantation land vulnerable to erosion. With ground cover plants, rainwater flow can be controlled so that the soil structure is maintained. In addition, intercropping systems provide ecological benefits through increased biodiversity around agricultural land. The presence of different types of plants helps to create an ecosystem balance and reduce pest attacks naturally.

In the training activities, the service team also provided an understanding of the importance of using organic fertilizers as an alternative to reducing chemical fertilizers. Farmers are taught how to use agricultural waste and organic matter around the environment as compost. The training in making organic fertilizers received a positive response from the community. Some

farmers stated that the use of organic fertilizers is more economical because the raw materials are easy to obtain in the environment around the village.

The use of organic fertilizers is also considered to be able to improve soil structure which has been experiencing a decline in quality due to the use of chemicals. People are beginning to understand that soil fertility is not only determined by the amount of fertilizer used, but also by the quality of organic matter in the soil.

In the mentoring process, the service team found that the low public understanding of sustainable agriculture was caused by the lack of access to previous agricultural training and counseling. Most farmers have never received training on land conservation and environmentally friendly agricultural management. Therefore, this service activity not only focuses on technology transfer, but also on increasing the knowledge capacity of the community. A participatory approach is applied so that the community can more easily understand and accept the agricultural innovations introduced.

The participatory approach is carried out by directly involving farmers in each stage of the activity. Farmers were given the opportunity to convey their experiences and problems they faced in coffee land management.

Through group discussions, the community began to realize that the agricultural practices that have been carried out need to be adjusted to the development of environmental conditions and climate change. This awareness is the first step in building a sustainable agriculture mindset at the community level. The change in people's mindset can be seen from the increasing interest of farmers to try more environmentally friendly farming methods. Some farmers began to implement an intercropping system independently on their land after attending the training. In addition to adult farmers, community service activities also involve village youth in sustainable agriculture training. The involvement of the young generation is carried out to encourage farmer regeneration and increase youth interest in the agricultural sector.

Village youth have an important role in the agricultural innovation process because it is easier to accept new technologies and information. In this activity, youth are involved in land management practices, documentation of activities, and the dissemination of agricultural information through digital media. Women's involvement in sustainable agriculture activities is also a concern in this service program. Village women are given an understanding of the management of agricultural products and the use of household organic waste as compost material.

Women's involvement has a positive impact on increasing community participation in environmental management activities. Women are becoming more active in supporting environmentally friendly agricultural practices at the household level. The monitoring results show an increase in public understanding of the importance of land conservation and sustainable agricultural management. Most trainees are beginning to understand the relationship between environmental quality and long-term agricultural productivity.

The community is also beginning to understand that sustainable agriculture is not only aimed at increasing production yields, but also maintaining the sustainability of natural resources for future generations.

In addition to environmental aspects, people are beginning to realize that the application of sustainable agriculture can provide economic benefits in the long term. Reducing the use of chemical fertilizers helps reduce agricultural production costs which have been quite high. The implementation of the intercropping system also opens up opportunities for diversification of people's income. With the existence of intercrops, farmers not only depend on coffee yields, but also get additional income from other commodities.

In the process of evaluating the activities, the community said that the training provided was easy to understand because it was carried out directly through field practice. This approach is considered more effective than the delivery of material purely theoretically. The success of increasing public understanding of sustainable agriculture is also supported by the active involvement of the village government and farmer groups. Local institutional support helps strengthen the community mentoring process in a sustainable manner. Farmer groups are an important medium in disseminating information and exchanging experiences between farmers. Through farmer groups, people can learn from each other about more effective and environmentally friendly agricultural practices.

Overall, this community service activity succeeded in increasing the understanding of the people of Keban Agung Village regarding the concept of sustainable agriculture. The community is starting to show behavioral changes in agricultural land management and has a higher awareness of the importance of preserving the environment. This increase in understanding is an important capital in supporting the development of community-based coffee agro-industry in Keban Agung Village. With the implementation of sustainable agriculture, the community is expected to be able to increase agricultural productivity while maintaining the sustainability of natural resources in the long term.



Figure 1.1 Farmers give an example of how to plant intermittent crops among coffee plants to maintain soil fertility and improve land use efficiency.

Strengthening the Coffee Agroindustry

The service program has also succeeded in increasing the capacity of the community in post-harvest coffee processing. Before the activity was carried out, most farmers sold coffee in the form of logs at low prices. After the assistance in the use of huller machines and coffee processing techniques, the quality of coffee products has improved.

Improving the quality of coffee has an impact on increasing the selling value of people's products. Farmer groups are beginning to have awareness to develop processed coffee products as part of strengthening local agro-industry.

Table 1. Changes in Conditions Before and After the Program

Aspects	Before the Program	After the Program
Cultivation system	Monoculture	Tumpangsari
Coffee processing	Traditional	Using post-harvest technology
Marketing	Limited locals	Digital marketing
Product added value	Low	Increase
Community participation	Limited	More active

Strengthening Digital Marketing Capacity

Digital marketing training has a positive impact on the community's ability to market local coffee products. Participants began to understand the use of social media as a means of product promotion. In addition, the public also gained an understanding of product packaging design and business branding. The development of digital marketing opens up wider market opportunities so that coffee products in Keban Agung Village have the potential to be marketed outside the Lahat Regency area.

Community Empowerment and Inclusive Economy

This service activity also encourages the involvement of women and youth in the development of village coffee businesses. Women began to be involved in the process of packaging and marketing products, while youth played a role in digital marketing and social media promotion.

The involvement of community groups in an inclusive manner has an impact on strengthening the local economy and increasing community participation in village development.

CONCLUSIONS AND RECOMMENDATIONS

The community service program in Keban Agung Village, Lahat Regency has succeeded in increasing the capacity of the community in the development of the coffee agroindustry based on appropriate technology. The implementation of the intercropping system and the use of post-harvest technology have a positive impact on improving the quality of coffee production and strengthening the economy of the village community. In addition, branding and digital marketing training is able to improve people's ability to expand market access for local coffee products. This program has also succeeded in encouraging the participation of women and youth in the inclusive development of the village economy.

Recommendations that can be given are the need for continuous assistance from local governments, institutional strengthening of farmer groups, and support for access to capital for the development of community coffee agro-industry businesses.

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